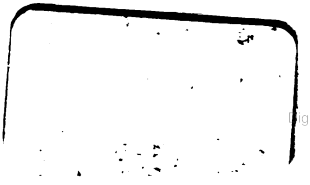
THE INTENSIVE TREATMENT OF SYPHILIS AND LOCOMOTOR ATAXIA BY AACHEN METHODS

HAYES



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THE INTENSIVE TREATMENT OF SYPHILIS & LOCOMOTOR ATAXIA

BY

AACHEN METHODS

(WITH NOTES ON SALVARSAN)

BY

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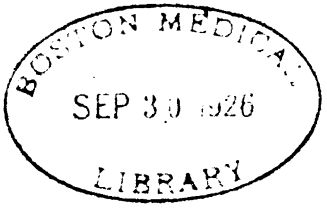


PREFACE TO THE THIRD EDITION

MEDICAL practice is continually supplying confirmation of the maxim, 'All that is true is not new; all that is new is not true.'

This is aptly exemplified in the use of inunction in the various manifestations of specific disease for which the administration of mercury may be considered necessary.

That this method, if properly applied, yields better results than are obtained by any other mode of giving the drug—and this without danger or pain—I shall endeavour to show in the following pages.

Let me emphasize at the outset that inunction of mercury must not be regarded as in any way a *rival* to the injection of salvarsan (or other trustworthy arsenical preparations). Each has its appropriate sphere, and its inevitable limitations.

I wish, above all, to lay stress upon the importance of the proper carrying out and careful supervision of the rubbing, for upon these very largely

depends the success of the treatment which it is the purpose of the following pages to describe.

Unskilled or haphazard methods of application lead to that uncertainty of results which is undoubtedly responsible for the fact that in this country inunction does not to-day hold the position to which it is justly entitled.

Though seemingly superfluous, the words 'and locomotor ataxia' have been added to the title, because, while both the diseases named are due to the same organism, the respective details of treatment present many points of contrast.

The present edition varies little from the first, written four years ago; but as modern research points to the advantage of methods still more intensive, shorter intervals between the salvarsan injections than those originally suggested are here advised. The illustrative cases have also, where possible, been brought up to date, and the composition of the unguent has been given.

Four illustrations have been inserted to show approximately the position assumed by patient and rubber during treatment.

Although in these the patient is, for the sake of clearness, shown as partially or wholly unclothed, in actual practice the parts usually protected by clothing are kept well covered, except when being rubbed.

I desire to acknowledge the courtesy of the editors of *The Lancet*, *The British Medical Journal*, *The Practitioner*, and *Guy's Hospital Gazette*, in permitting me to make use of articles of mine which have appeared in the columns of their journals.

REGINALD HAYES.

93, CORNWALL GARDENS,
S.W. 7,
November, 1918.

The Intensive Treatment of Syphilis and Locomotor Ataxia by Aachen Methods[1]

Modern Alternatives to Mercury.

In spite of many competitors during several centuries of use as a remedy for venereal disease, mercury (provided that it be adequately administered) may safely be said to remain the most generally satisfactory agent for the treatment of syphilis and of so-called 'parasyphilitic lesions'; for that diseases of the latter class are directly due to the presence of the *Spirochæta pallida*, or to some phase of its life-cycle, has now for some time been clearly demonstrated. Of all drugs, ancient or modern, that have challenged the supremacy of mercury as an antisyphilitic, none can compare in efficacy with the newer class of arsenical derivatives, of which the Ehrlich-Hata preparation, salvarsan, was the

[1] By Aachen methods I mean the inunction of a 33⅓ per cent. mercurial ointment by the bare hands of a skilled rubber, under proper medical supervision, and in addition the use of sulphur water internally and externally, as administered at Aachen. This is the essential thing, or foundation on which treatment is based, adjuncts being used if so indicated.

first to be extensively used. Yet their position at the present time—much as was claimed for them at first—may be described as, at best, that of valuable assistants to the older remedy, or of co-partnership with it.

In early syphilis—and it is there that the most brilliant results of these drugs are seen, owing to the spirochætal infection being then either quite local or chiefly confined to the lymphatic and vascular channels—it is now generally agreed that the best effects are obtained by giving them in conjunction with mercury, exhibited energetically. In late syphilis, in which the infection is often situated in parts which for anatomical reasons are not easily reached through the blood-stream—as, for example, some portions of the cerebro-spinal system, or pathological non-vascular structures such as gummata—salvarsan is of small utility, owing to the transitory nature of its influence, due to rapid elimination, when safe doses are used. Here the superiority of mercury intensively administered is particularly marked. Moreover, there are certain conditions in which, while salvarsan is either useless or absolutely contra-indicated, intensive mercurialization, cautiously applied, remains our sheet-anchor, and can still be employed with considerable benefit and practically no risk. As coming under these conditions may be mentioned a large pro-

portion of those cases in which there is serious affection of the central nervous system, disease of the circulatory and respiratory organs, hæmophilia, certain conditions of the liver and kidneys, advanced age, and also that group where a marked susceptibility to arsenic exists. Moreover, with these arsenical derivatives, it appears (not to mention minor difficulties) that, even after taking the most elaborate precautions, there remains a danger which is never quite calculable, owing to the toxic influence of the arsenic. It cannot be forgotten that this agent has caused death from hæmorrhagic encephalitis shortly after injection in some cases of non-syphilitic disease; a fact which must partially invalidate the endotoxin theory of Ehrlich, Wechselmann, and others.

The occurrence of hæmorrhagic encephalitis after a salvarsan injection, in cases of cerebral syphilis, has been recorded by several observers; hence the importance of treating such cases with preliminary courses of mercury and iodide is now generally recognized. It should be noted that the use of adrenalin has proved of great efficacy in certain instances, both as a prophylactic and as a remedial agent after the onset of untoward symptoms.

We may assume, however, that as our growing experience leads to greater care in the selection of patients and a better knowledge of the contra-

indications of the drug, likelihood of this unfortunate event will be eliminated.

Excellent as often are the immediate results of these newer arsenical derivatives, of their remote effect on the body we as yet know virtually nothing, so comparatively recent has been their introduction. Many more years of experience will be necessary before their true value and limitations are determined, and for the present our ignorance in the matter should dictate the greatest caution in their use. Sir Jonathan Hutchinson's view that internal administration of arsenic may tend to the development of epithelioma is perhaps worthy of more attention than has hitherto been accorded to it.

The steady advance of medical science will, possibly, lead eventually to the substitution for spirochæticidal drugs of a vaccine or serum. Already, indeed, something has been done in this direction by injecting salvarsanized serum into the cerebro-spinal fluid, by means of lumbar or cranial puncture, in those suffering from the later effects of syphilis of the central nervous system, such as tabes and general paralysis. This form of medication by injection into the cerebro-spinal fluid was suggested in 1911 by Marinesco, of Bucharest [1], for the treatment of general paralysis, and its application to tabes dorsalis elaborated by Swift and Ellis, of the Rockefeller Institute, in New York.

The method, or some slight modification of it, has now been extensively tested, with results which, as regards the treatment of tabes, seem to leave us very much as we were before its introduction.

It is true that some observers have reported encouraging results—such as relief of pains and other tabetic manifestations, with increase of weight and all-round improvement. The good effect, when it has been obtained, is attributed to the presence of spirochætal antibodies and minute traces of salvarsan in the serum. This can be prepared either from human beings or from certain animals.

Another plan—namely, the injection directly into the cerebro-spinal fluid of a solution of neo-salvarsan—has been given a trial by Ravaut [2], and others, who express themselves generally as dissatisfied with the outcome. With this opinion, none who have studied the facts are likely to disagree.

Also unsatisfactory, though less dangerous, has been the result of administering in a similar manner small doses of perchloride of mercury dissolved in horse serum.

The failure of intrathecal injections of salvarsanized serum to replace other methods in tabes dorsalis seems to be now generally admitted. We know, too, that in general paralysis of the insane, while a marked temporary improvement is occa-

sionally obtained, the injections are sometimes responsible for disaster.

Some experience of locomotor cases treated on these lines leads me to the conclusion that the *immediate* mitigation of symptoms reported by certain observers may fairly be attributed to the intravenous injections alone, and can be produced equally well by this more simple procedure. Indirectly Leredde's [3] results with novarsenobenzol, seem to support this opinion. As the pressure of the cerebro-spinal fluid is raised in some cases, it seems reasonable to suppose that benefit is derived from the relief afforded by the lumbar puncture and from the fresh supply of antibodies which follows. The question is one of considerable moment, as certain positive disadvantages may attend the operation. Apart from the risk of meningitis and myelitis, any avoidable operative interference in the case of tabetics is to be strongly deprecated. These patients should be protected as far as possible from shock and pain, to which they are peculiarly susceptible, and which they bear very badly. Now, great pain and distress often follow the injection, and frequently necessitate the use of morphia. Several sufferers from tabes under my care, in whom lumbar puncture was performed by experts, for diagnostic purposes or for the intrathecal injection, have had their troubles considerably aggravated as a consequence.

Moreover, the number of intrathecal injections which may be required in converting or in attempting to convert the cerebro-spinal fluid from positive to negative is quite uncertain; so, too, is the length of time it will remain negative after its conversion. We know that without treatment the fluid sometimes gives a negative reaction in tabes. Chronic diseases as a rule require chronic remedies, and when we consider the pathology of tabes and the fact that drugs introduced into the cerebro-spinal fluid are rapidly eliminated, it would seem unduly optimistic to expect permanent improvement from a few injections. Dr. Arthur Hurst [4], who has had much experience of syphilis of the nervous system among soldiers, asserts that intrathecal medication for this condition is not only theoretically irrational, but practically dangerous. Later clinical records generally support this view. In estimating the value of various lines of treatment in such a disease as tabes, we ought to know the patient's condition at least two years later. To publish prematurely, as benefited or cured, cases which show temporary improvement and which afterwards (perhaps before the printer's ink is dry) relapse, is as undesirable as it is unwise.

Up to the present time, however, serum therapy as usually applied has failed to be of service—a fact due not only to the lack until lately of a satisfactory

method of cultivating the treponema outside the human body, but also, as indicated by Neisser [5], to the difficulty, if not the impossibility, of obtaining a suitable virus. It is interesting to note that the cultivation of the spirochæte *in vitro* and in certain animals by Hideyo Noguchi and others appears to afford fresh possibilities in this direction. Or it may be, perhaps, that in the application of some newer discovery in the science of chemiotherapy a more reliable curative agent will be found. The search for an ideal remedy, bacteriotropic and not organotropic, is being diligently pursued and many new fields explored.

As, at the moment, much is being claimed for compounds of the comparatively non-toxic elements, sulphur and iron, it is worth noting that sulphur water has always been an essential part of the Aachen cure, while a ferruginous mixture or pill was prescribed by the late Dr. Feibes for a few weeks afterwards, almost as a routine measure.

While, obviously, our patients should reap the benefit of all definite medical progress, let us strive to preserve a strictly judicial attitude and refrain from abandoning old and well-tested drugs in favour of new ones imperfectly tested, always bearing in mind that it is not only wise, but our obvious duty, to make sure that those which have proved trustworthy are put to the best possible use.

Mercury as an Antisyphilitic.

In the hope of furthering this purpose in regard to mercury as an antisyphilitic, I propose to discuss briefly the manner in which it is usually given at the present day. Unfortunately this necessitates going over some more or less familiar ground, as well as a certain amount of repetition, for both of which the great practical importance of the subject and a desire to avoid ambiguity must stand as excuse. Having regard, then, to the conditions for which mercury is used, and to the urgent need for freeing the body from the causative organism *as rapidly as possible*, and with the minimum of danger, pain, and discomfort to its unwilling host, it behoves us to consider with all proper care and gravity the mode of administration we propose to employ. That this point has hitherto not always received such due consideration is owing, among other things, to the amazing variations which the disease may exhibit in its course, at one time seeming to get well spontaneously, at another proving refractory to all forms of treatment. Again, in this country the type of syphilis, in its earlier stages especially, is changing to one of a much milder kind than that seen a few decades ago. For this we are no doubt largely indebted to the means of earlier diagnosis, but it may be also partly accounted for

by the fact that the disease is perhaps more widespread than formerly, owing to the greatly increased facilities for travel. Other differences in our habits of life also tend to affect the type, chief among them, perhaps, being the diminished consumption of alcohol, greater personal cleanliness, and a growing conviction of the importance of thorough treatment. The possibility of ancestors, recent or remote, having been infected must also be considered in this connection.

Methods of Administration of Mercury.

In addition to the frequent tendency of syphilis to become latent, to which mercury given in inefficient quantities contributes, by making it appear that all is well when all is not well, the above-mentioned characteristics of the disease have made it no easy matter to estimate the relative value of the many ways in which the drug has been given. Social considerations, convenience, a desire for secrecy, ignorance or carelessness on the part of patient or doctor, the perennial hankering after something novel in treatment—all these have at one time or another had their share in confusing the issue and making it difficult to give a definite answer to the question, as important now as ever, What is the best method of administering mercury

to free or assist in freeing the body from the causative organism in the *safest and most rapid manner?* We must never lose sight of the fact that, in the light of our present knowledge, rapidity in the process of sterilization, combined, of course, with safety, should be our principal aim in treatment, and is worth some sacrifice in other directions. Rapidity is desirable especially with a view to curtailing the infective period, preventing the formation of a resistant strain of organism, and allowing no time for its entrenchment in the deeper parts, which, it is now recognized, can occur very much sooner after infection than was formerly supposed.

Continuous Oral Administration. — The current modes of giving mercury in syphilis may be broadly classified as the continuous and the intermittent. Of these, the first has enjoyed during the past two or three decades—indeed, until quite lately—a very marked degree of popularity, the drug in small doses being taken by the mouth several times daily, in the form of pills or liquid mixture, so as to keep the patient mildly under its influence. Given thus, especially according to the formulæ and in the manner advocated by the late Sir Jonathan Hutchinson, it undoubtedly marked a decided advance on previous fashions of prescribing.

To-day, however, it may be said that evidence from a variety of sources, which has taken many

years to accumulate, has thrown the gravest doubt upon the desirability of its continued use, if other means can possibly be employed. For instance, as the responsibility of carrying out this treatment must often be left to the patients themselves, it cannot be regarded as altogether satisfactory, especially in view of the very prolonged period during which medication should be continued, as well as of the age at which as a rule it is required.

A further disadvantage is its marked tendency to upset the gastro-intestinal tract, as evidenced by the diarrhœa and cramp which frequently result. This is — at any rate partially — due to direct chemical irritation, which often necessitates the simultaneous exhibition of opium, thereby causing interference with many of the normal functions, or even entailing the complete cessation of treatment for a time. Moreover, however mercury may be taken, it is always in part excreted by the bowel, which it is therefore of supreme importance to keep in the best possible condition during the administration of the metal.

When mercury is ingested, it is a matter of common knowledge that the patient is brought under its influence only by slow degrees, clinical and laboratory evidence on this point being both ample and conclusive. This fact renders the method absolutely unsuitable in the presence of urgent symptoms,

as in the case of cerebral syphilis, when every hour counts. It may be added that the experience of many authorities tends to show that in syphilis the use of small doses of mercury given by the mouth is not protective against secondary and tertiary mischief. Head [6] mentions four cases in which pills were actually being taken under guidance of an expert at the time that serious nerve syphilis supervened. Case 2 (p. 63) in my series presented similar features.

Sir Felix Semon [7], in dealing with this question, has stated that almost every patient he had seen with severe tertiary affections of the upper air-passages had undergone mercurial treatment *per os* in the early stages of the disease—not a few of them for the two years enjoined by Sir Jonathan Hutchinson. Workers in such special departments as those dealing with disease of the eye, ear, skin, nervous system, and mind, all agree regarding this not uncommon failure to prevent late symptoms—a matter, be it remembered, affecting the safety and well-being of both present and future generations. The outcome of my own work in the treatment of tabes and nerve syphilis quite accords with these expressions of opinion.

It is thought by some also to predispose to buccal lesions, especially to glossitis of an intractable form, with its attendant danger of epithelioma linguæ.

These conclusions from the clinical side alone point strongly to the untrustworthiness of the method of internal administration; but they are both supplemented and explained in the most convincing manner by laboratory workers with the Wassermann reaction. Thus it has been found by H. W. Bayly [8] and others that after taking pills for six months there was either no effect at all, or a negative reaction which was not justified by the subsequent course of the case; and that, as compared with injection or inunction, internal medication is very much the least effective method. These results have been confirmed by a number of independent observers, and must lead to the reflection that in many instances the use of mercury by mouth is little more than a placebo, and this, be it noted, in a condition urgently requiring the promptest and most vigorous efforts at thorough eradication.

Taken altogether, then, this experience, gathered from such a variety of clinical sources, based upon many years of experiment, and supported as it is by delicate modern laboratory investigations, may be regarded as constituting a contra-indication so imperative to continuous or internal treatment as absolutely to preclude its use whenever it is possible to apply any other.

The Intermittent Mode of Administration.—Let us now consider the second, or intermittent, line of

treatment. This is the method now most generally in vogue. The majority of those who adopt it give the drug as it were by schedule, in definite courses and at regular intervals; as well as at other times, if there is any obvious manifestation of the disease.

To enable the body to recover its auto-defensive mechanism, a period of medication is followed by one of rest, further treatment being given in accordance with a procedure which has proved to yield the best results. Clinical experience is now, of course, supplemented by the Wassermann test, which affords information of the greatest value, both as to the necessity for active therapeutic measures and as to their duration. The investigations of practically all workers with this test tend to demonstrate the superiority of the intermittent over the continuous method, while the former has the further distinct advantage of insuring direct supervision by the medical adviser. It is now usually employed in one of three ways:

1. By intramuscular injection of soluble salts in aqueous solution, or of metallic mercury or calomel suspended in an oily medium.

2. By calomel fumigation.

3. By inunction of the skin with a mercurial ointment.

Injection Methods.—Judged by the standard of convenience and by clinical and laboratory results,

the various injection methods, if properly carried out, have much to recommend them. There are instances, indeed, in which injection may be the only satisfactory manner of employment, as, for example, where time is very limited and financial expenditure is a great consideration, or where certain skin conditions render inunction impossible. The methods have also their uses as adjuncts to the rubbing. We must not, however, overlook certain disadvantages more or less incidental to all forms of injection. Even in the most skilled hands these include the possibility of severe pain, troublesome induration, hæmatoma, abscess (due sometimes to faulty composition of the material by the manufacturer), and embolism, as well as the inability to control the effect of the drug after introduction. This inability may cause in the case of the insoluble preparations the condition known as mercurial stasis, which can be followed by such appalling results. The patient's dread of the needle, too, must be taken into account; nor must we ignore the fact that cases of death, both sudden and remote, due to injection have been and continue to be recorded. Hæmophilia is an absolute bar to its use. In view of these considerations it is scarcely necessary to urge the unsuitability of injection for general or indiscriminate application.

Calomel Fumigation.—This method was at one

time much practised, and is still occasionally of service (if great caution be observed), especially in certain skin manifestations. It has, however, largely fallen into disuse of recent years, its action being uncertain and somewhat difficult to limit.

Inunction.—For the third or inunction method —if applied in properly selected cases by skilled rubbers (an essential point) and controlled by careful supervision—may be claimed safety, potency, and painlessness, with exemption from most of the drawbacks which we have seen to attend other kinds of treatment. It is with this method that the name of Aachen has for many years been associated.

Impressed by the benefits, subjective and objective, derived from a sojourn there by a number of patients coming under my observation—most of whom had previously taken mercury by the mouth for long periods without benefit, or had tried injection, auto-inunction, inunction at other spas, or the application of the drug by means of glass rubbers or gloves, the latter being the method in favour at Hot Springs in America—I resolved to investigate on the spot the technique as well as the results obtained.

While at Aachen, thanks to the courtesy of the late Dr. Feibes, I had the opportunity of observing the effect of the measures used on a number of patients suffering from many forms of the disease,

of whom those presenting symptoms of tabes formed, as usual, a considerable proportion. Of these latter many had been told by authorities of acknowledged eminence that they must resign themselves to the discomforts incidental to their condition as inevitable and incurable; yet after having been in some cases reduced to most crippling degrees of ataxia, they were sufficiently restored to health by prolonged courses of baths, waters, inunction and exercises, to be able not only to walk, but to enjoy an existence of modified activity. Progress was shown in numerous other ways, as, for example, by disappearance or decrease in the severity of the pains, crises, and other tabetic complications. A substantial proportion of these visitors returned year after year for a further course to insure against relapse. They did so, they would tell you, not only under advice, but because their own subjective sensation of improvement, after undergoing a cure, satisfied them as to the desirability of such action.

On the other hand, failure to present themselves for treatment at the proper interval was frequently followed by a return or increase of symptoms. Of this, the great war has been instrumental in furnishing examples.

The Aachen Method.

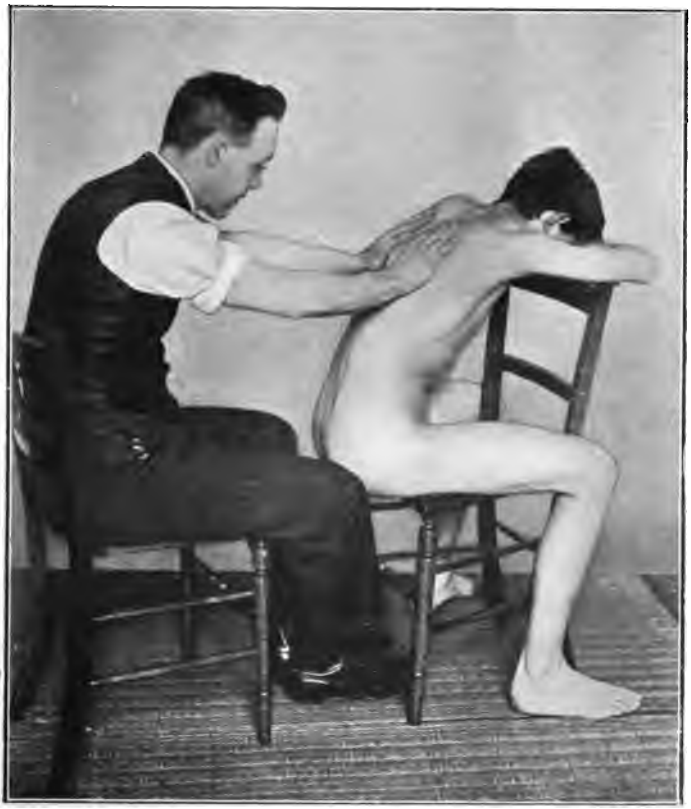
With the methods of inunction as usually carried out in England I was, of course, familiar, but the contrast presented by the technique adopted at Aachen could not fail to impress one in its favour. The close attention there paid to detail is most striking. An exhaustive physical examination is made before beginning the treatment. The heart, lungs, kidneys, liver, teeth, and nervous system are each in turn carefully considered, while the characteristics and clinical picture of the individual are also taken into account, for contra-indication to intensive mercurialization may exist, or modification of it may be required in cases of albuminuria and glycosuria of non-syphilitic origin, hepatic inadequacy, advanced valvular disease, pyorrhœa, etc.

To describe the usual procedure: The morning is begun by drinking from one to three glasses of the sulphur water, starting, as a rule, with the smaller amount, and increasing it as the cure progresses. Next comes the bath, which is carefully adapted to the condition of the patient, the temperature and length of immersion being cautiously regulated according to the type of disease from which the patient is suffering.

Thus, a vigorous young subject with active early syphilis may with advantage be given a warmer

bath and one of longer duration than would be suitable for an enfeebled and elderly tabetic, in whom the pains may be started or aggravated, and to whom much discomfort or worse may be caused by neglect of this apparently trivial detail. The temperature of the room should be 70° F., that of the water (it should always be verified by thermometer) may be from 95° to 100° F. The lower degree of warmth with a duration of a few minutes will be found best for tabes cases. Sufferers from recent infection are as a rule submitted to the higher degree for ten to twenty minutes—though naturally in this matter individual peculiarities, such as age, physical fitness and so on, should have due consideration. Of the parts usually rubbed, only those to be treated that day are shampooed. Care is taken that the towels are both dry and hot. The bath is succeeded by a rest and breakfast in bed, to be followed soon after by application at the hands of an expert rubber, as a rule for from twenty to forty minutes, of a 33⅓ per cent. mercurial ointment, the quantity and site of inunction varying according to circumstances. For this purpose the palms and palmar surface of the fingers are used and an even pressure maintained as strongly as the patient can bear without discomfort. The hands should never be unpleasantly cold, and it is advisable that all hair be removed from the parts to be rubbed.

PLATE I.



TREATMENT OF THE BACK.

To face p. 20.

The composition of the unguent is as follows:

Hydrarg. pur.	100
Adeps lanæ	15
Ol. olivæ	3
Adeps	112
Sevum ovis	70

Adde acid. carbol. 1 per cent.

This formula is the outcome of many years of experiment, and it is doubtful whether any other mixture would prove quite so effective.

For a twenty minutes' rubbing 5 grammes, for thirty minutes 7 grammes, and for forty minutes 10 grammes, are commonly used.

Rubbings are given during menstruation, but bathing is omitted.

The thighs, calves, arms, and back are usually treated in turn from day to day. The groins and axillæ are avoided. Though in this country these parts are frequently submitted to inunction, a very short experience will demonstrate that they are quite unsuited for a thorough and prolonged application of the remedy.

Thorough ventilation of the bedrooms and sitting-rooms is strongly recommended, but risk of incurring chill should, of course, be minimized by proper attention to clothing and to heating arrangements.

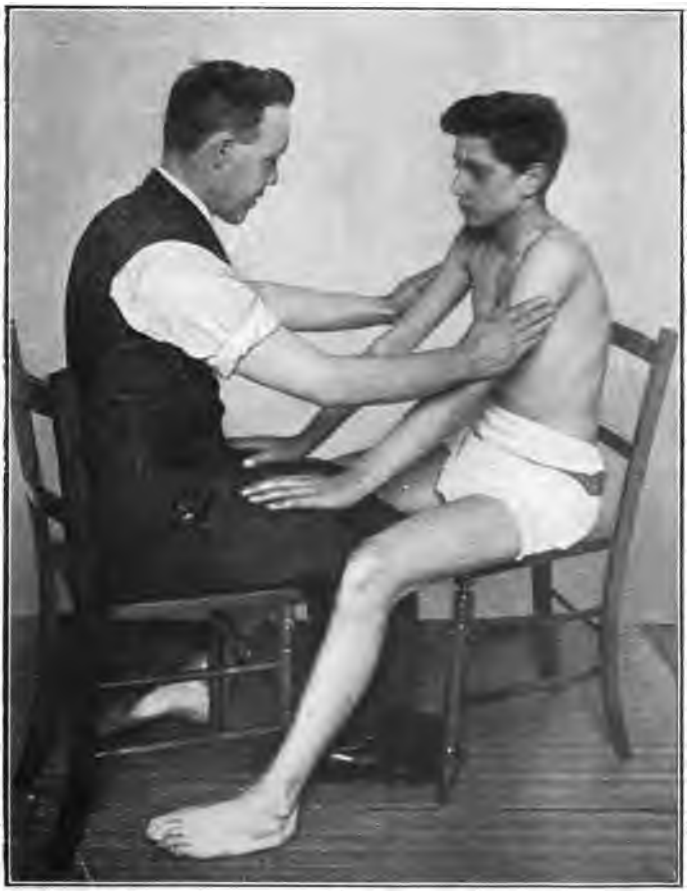
Stress is laid upon mouth hygiene, the removal of stumps and tartar being insisted upon as a preliminary measure. A soft toothbrush is used after

meals, and a mouth-wash at intervals during the day. These precautions permit mercury to be administered even, if need be, to the point of causing a condition of general lassitude and drowsiness or intestinal cramps, without the occurrence, save very rarely, of salivation or gingivitis, which are almost invariably associated with failure to observe these directions.

The necessity for such care, as well as the potency of inunction as compared with internal medication, is illustrated by the commonly observed fact that the presence of a stump or neglect of the mouth toilet even for a day or two may rapidly cause severe gingivitis during its application, and this sometimes in patients who have previously taken courses of mercury by mouth for months with little or no buccal discomfort.

Nevertheless, it appears to me that as a rule the occurrence of salivation and gingivitis does not form anything like an accurate index to the amount of metal absorbed, nor is it of value in calculating the effect upon the spirochætal infection. This, it is true, is contrary to the views generally held on the subject. It requires, however, only a limited experience of this special branch of practice to learn that these symptoms may be induced in susceptible individuals by quite small doses of mercury taken internally, especially if the resistance of the mouth

PLATE II.



TREATMENT OF THE ARMS.

To face p. 22.

be lowered by the presence of tartar, stumps, or pyorrhœa. On the other hand, I have known patients, where due care has been exercised, to undergo with great benefit courses of from 100 to 250 rubbings, without the supervention of any mouth trouble whatever. This idea that 'touching of the gums' is indicative of the limits of physiological tolerance having been reached, or even of the patient's being well under the influence of the drug, would seem to be responsible again and again for failure to get the best possible result from mercurial administration.

Auxiliary Methods.—Articles of diet calculated to produce looseness of the motions, such as white wine, fruit and vegetables (if in an uncooked state), are forbidden. Early hours are enjoined, as well as moderation in the use of alcohol and tobacco, or complete abstention from them, especially when the mouth or throat is affected. Plenty of fresh air and exercise short of fatigue are also found to contribute in no small degree to the attainment of a good result.

At Aachen, owing to the varying types of patient and of manifestations of the disease, the ritual was modified according to the needs of each individual case, and a similar principle should govern in pursuing the treatment elsewhere. Drugs of the salvarsan class, for instance, were often given

there during the course, every case being considered on its merits in the matter of dose and frequency.

A subsequent rest cure, with overfeeding, massage, and perhaps electricity, frequently proves a most valuable supplement to the rubbing in certain instances where nerve symptoms are prominent, and in all serious cases it is to be strongly recommended. It may here be noted as an interesting fact that the pains of tabes are often relieved by either the static or high frequency currents. The former is the more suitable when the blood-pressure is low, the latter when it is raised.

It is no less than a duty at this point to warn sufferers from nerve syphilis that they must henceforward live under limitations which it is of the utmost importance that they should fully realize. A relapse is likely to follow any shock, undue exposure, or overstrain, physical or mental. Avoidance of these they must recognize as being imperative, whether in business or private life.

Balneo-Therapy.—While the peculiar efficacy of the Aachen method is undoubtedly due largely to the thoroughness and close attention to detail which I have already remarked upon as distinguishing its performance there, the employment of balneotherapeutics as an adjuvant must be credited with an important share in the results.

PLATE III.

TREATMENT OF THE THIGHS.

To face p. 24.

Now, the rôle of sulphur water,[1] did it not directly assist the mercury, would be of secondary importance. But there is strong evidence that it does so assist. The modern view is that mercury, shortly after its introduction into the system, is converted into an insoluble albuminate, and is subsequently stored in the tissues as a partially inert body. The H_2S of the mineral water, however, unites with this, and converts it into an active soluble compound, which circulates freely and is easily eliminated. This reaction between the organic salt and the gas has only comparatively recently been demonstrated *in vitro*, for it does not take place without the addition of blood-serum. Thus, in conjunction with sulphur water, mercury can be given freely, the ease with which it is eliminated being shown by the amount recoverable from the urine.

At the end of a course of mercurial treatment, without sulphur water, the amount of the metal excreted in the urine has been measured for a series of days; and subsequently during a similar series of days while the patient was taking sulphur water

[1] The Aachen waters belong to the class known as muriated sulphurous. The saline contents is 3·63 grammes per litre, composed principally of sodii chlorid., 2·86; sodii carb., 0·637; calc. carb., 0·133; with small amounts of hydrogen sulphid., sodii sulphid., sodii iodid. and sodii bromid.

by mouth. During the second period the amount of mercury recovered was noticeably in excess of that recovered during the first.

Sulphur waters augment nitrogenous metabolism, and so give rise to increased excretion of urea and sulphates. They cleanse, as it were, the whole system, promoting diuresis and catharsis, increasing excretion by the skin, checking bacterial growth, and facilitating the discharge of toxins. The appetite is stimulated and gastric digestion restored, while the flow of bile is notably increased.

Thus we see that sulphur facilitates the employment of an intensive treatment by flushing the tissues with a soluble mercurial salt, and at the same time insuring its rapid elimination. Consequently, large doses of the metal may be given with the certainty on the one hand that they will not prove therapeutically inert, and on the other hand that their toxic effect will be minimized. It is a matter of common observation that temporary cessation in taking the waters during an Aachen cure is often followed by a train of symptoms, such as lassitude, anorexia, cramp, and so on, all of which may disappear on resuming them in proper quantity.

Other Influences.—At Aachen the effect of mingling with fellow-sufferers had probably a more profound influence on the individual patient than it had at other spas.

PLATE IV.

TREATMENT OF THE CALVES.

To face p. 26.

As elsewhere, this association was beneficial or the reverse, according to temperament. In any event, the appearance of bad nerve cases and the reports of old stagers among the visitors, who had not only done well themselves but had seen others do well here after failure somewhere else, conveyed both warning and encouragement, which it was impossible to ignore, and which certainly tended to emphasize the necessity for taking matters with due seriousness.

The advice generally given to nerve cases, even though seemingly well, that they should pay an annual visit was good: for the physician, possibly, but certainly for the patient. Doubts on that point by some critics of the spa were more cynical than wise.

Duration of Treatment.

The length of treatment necessary for a case of uncomplicated syphilis during the first two years has been until lately generally considered to be about six months, taken in courses of from four to six weeks, with intervals of rest. During part of this time some preparation of iodine was usually prescribed. Many authorities, however, dissatisfied —as they had reason to be—with the results so obtained, and as an outcome of their practical experience, have regarded with favour a further short

course yearly for three or four years, or possibly longer, even in the absence of clinical manifestations.

How wise was this advice of certain experts of pre-Wassermann days has been conclusively demonstrated by recent tests and investigations, which show the frequent latency of infection long after apparent cure. Since the invaluable discovery of the serum reaction and the introduction of salvarsan, old methods and formulæ have passed to a large extent into the melting-pot. For this reason it is impossible, at the present time, to be dogmatic as to the length of treatment required for those presenting signs of ordinary syphilis. Each case must be specially considered in the light of modern clinical and laboratory methods before making a decision. Dark-ground illumination and the use of the ultramicroscope enable the necessity for treatment frequently to be determined at a much earlier stage than was possible for the older clinicians, and the use of one or other is most strongly to be advocated in investigating all doubtful sores and abrasions. The appearance of the initial lesion and the type of adenitis present may also be taken into account with advantage. In later stages guidance must be sought in clinical symptoms and the Wassermann test. Once the diagnosis of syphilis is certain, an endeavour to effect the *therapia*

sterilisans magna of Ehrlich should be made as soon as possible, unless serious contra-indications exist.

General Treatment of Syphilis.

Where it can be done, it is advisable as a first step to destroy the site of inoculation by excision or the actual cautery, and, whether this is possible or not, to inject hectine or a solution of hydrarg. perchlor., in isotonic saline solution (strength ¼ grain in 5 c.c.), into the surrounding tissues; or ionization with a salt of mercury may be employed. If none of these measures are feasible, the rubbing in of calomel ointment (Metchnikoff's formula) is strongly to be recommended.

The patient should then be submitted to a course of intensive mercurial treatment for ten weeks. In conjunction with this should be given at intervals of seven days a minimum of three intravenous doses—as full as may be considered safe—of salvarsan, or one or other of the reliable arsenical preparations. By this means, or a slight modification thereof, the rapid disappearance of primary and secondary manifestations,[1] with the conversion

[1] In a patient of my own, where the presence of the *Spirochæta pallida* in a doubtful sore on the penis was demonstrated by H. W. Bayly by means of the ultramicroscope, submission to nine weeks' Aachen ritual, in conjunction with three full doses of salvarsan, effected what

of the blood test from positive to negative, has frequently been effected. In a fair proportion of cases this condition has continued up to the present date, a period in some instances of four years having elapsed since cessation of all treatment. Use of the provocative injection has in several instances been made before the blood test. There is thus every reason to assume on clinical grounds and laboratory evidence that the disease has been thoroughly eradicated.

Satisfactory as these results undoubtedly are, the best interests of the patient, considering all that is at stake, are served by prolonging treatment for a year by means of two further courses of inunction of six to eight weeks each (or if this is not feasible, six to eight injections of grey oil at seven days' interval), a period of two months elapsing between the courses.

Some iodine preparation should be given during

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may probably be regarded as a cure. For certain weighty reasons no further remedial measures were undertaken, yet no symptoms of any kind developed, and subsequently the blood test performed every three months for two years was negative. He now reports himself perfectly well (1918). Similar good results were obtained by the same procedures in several other cases, where primary sores had developed, with adenitis in the groin, before treatment was begun, and afford proof (as shown clinically and by the blood test) of the powerful sterilizing effects to be obtained by this combination.

three weeks of these intervals. If secondary symptoms have developed, the above scheme should be extended to two years at least.

In the absence of clinical symptoms, the occurrence of which calls for repetition of the course, treatment should be withheld for three months, when the question of further therapeutic measures should be decided by the degree of infection which existed when the routine here advised was begun, and by the Wassermann test, repeated subsequently at intervals of thirteen weeks.

It would seem eminently desirable that at any rate the first course of mercury should be given by inunction, since the greater potency of the drug thereby assured affords the best chance of the early sterilization which it is so highly important to obtain, and this even if other means have subsequently to be employed.

Syphilis of the Nervous System.

Knowing as we do that in a large percentage of apparent cures the disease has merely become latent, it is interesting now to note that, some time prior to the invaluable discovery of Wassermann and the more recent demonstration by Noguchi of the spirochæte in the brain and spinal meninges, Henri Pelon [9] advocated a considerable increase in the period devoted to mercurialization, on the ground

that though tertiary conditions have their apogee at three years, they may continue much longer. He further laid stress on the fact that general paralysis, beginning about the fourth year after infection, becomes progressively more frequent up to the tenth year. Cerebral syphilis is common between the fourth and eighth years. Tabes reaches its culminating point between the fifth and ninth years. Thus, from the fifth to the tenth year—that is to say, when treatment has usually been abandoned—the patient is peculiarly liable to the three worst complications of syphilis. There can be no doubt that either premature abandonment, or insufficiency, of therapeutic measures may be responsible for the development of these three complications. Hence, if early sterilization has not been attained, treatment should certainly be continued, if only for the insurance it will probably afford against these troubles.

So obviously sound is this doctrine now recognized to be, that it is difficult to realize that as late as 1908 it was classed as advanced therapeutics, and had in Henri Pelon its only prominent, if not its sole, advocate. The actual application of the remedy varies according to the condition and may be briefly considered.

General Paralysis (Degenerative Encephalitis).—In this disease the likelihood of doing good is small.

Nevertheless, provided that an early diagnosis be made, and that the attack is a first one, prolonged and not too energetic antisyphilitic treatment in the manner advised for locomotor ataxia (p. 36) should certainly be tried. In cases of my own I have seen benefit result from this method, and similar results have from time to time been recorded by others. The salvarsan, however, should be dispensed with, or quite small doses used. Unfortunately the patient's inability to co-operate, except where the mischief is only incipient, often makes it very difficult thoroughly to carry out the routine. In the quiescent stage, it is best not to interfere. How guarded and careful should be the lives led by these patients, it is scarcely necessary again to urge.

Cerebral Syphilis.—Whether the trouble is due to gumma or meningitis, the most prompt and vigorous exhibition of mercury by rubbings, in conjunction with some iodine preparation, is called for. In such serious cases half measures are fraught with especial risk, and nothing must be left to chance.

The mercury should be pushed to the limit of the patient's tolerance. This is reached practically always about the hundredth day of Aachen treatment, if not, indeed, long before.

Proceeding with great care, the length of rubbing may be extended to twenty or even thirty minutes

twice daily and the quantity of unguent used each time from 5 to 7 grammes. This is a much more potent course than that prescribed in tabes, where one twenty minutes' rubbing daily is the maximum to be advised. After some sixty days of rubbings and iodine administration, concentrated neo-salvarsan injections or their equivalent may be cautiously begun. Ill effects rarely follow if these details be observed, but if any sign of reactionary trouble is met with, an injection every four hours of 1 c.c. adrenalin chloride solution (1 in 1000) diluted with three parts of normal saline solution should be administered. Several of these may be given, one-half being injected subcutaneously and the rest intramuscularly, this being done to prevent too rapid excretion. A second dose of neo-salvarsan in about twenty-four hours is to be recommended.

Iodide in doses of 10-20 grains should be given every six hours, and if when taken thus it upsets the gastro-intestinal tract, as it is peculiarly liable to do during intensive mercurial administration, iodipin or tiodine injections may be substituted.

While the mercury should be persevered with, the value of iodide in this class of case is very great, owing to its power of helping absorption. It seems highly advisable that salvarsan should not be exhibited in cerebral syphilis till the patient has sub-

mitted well to the influence of mercury and iodide, as the occurrence of reactionary inflammation in the neighbourhood of the diseased spot may be followed by death, a result of which several instances have been reported. The fatal event may be due either to hæmorrhagic encephalitis or to the liberation of toxine or perhaps to both together.

Locomotor Ataxy.—Once recognize the fact that in cases presenting symptoms of tabes the mischief may be due either to disease of the cord or the meninges, or both, coexistent perhaps with cerebral or cerebro-meningeal trouble, and explanation is found not only of the variety of symptoms, objective and subjective, but also of the differences in response to treatment, with which we are all familiar. It is obvious that as a rule the likelihood of doing good is much greater early than late, and in meningeal rather than ameningeal disease. Even then, however, where the meninges are principally involved, treatment must be lengthy and often repeated, in order to attain the best ultimate results. We have but to consider the complex pathology of the condition to acknowledge the futility of expecting permanent good after only a short course, and the unwisdom of ignoring the necessity for active measures at a later stage.

In advising the procedure to be adopted in each

case we must be guided by observation of the individual response to treatment and feel our way cautiously in accordance therewith.

The experience of Brandis and Feibes [10], extending over a long period at Aachen, points to the advisability of prolonged courses of rubbings on consecutive days, 100 to 200 not infrequently being given. They urge, moreover, that scrupulous attention should at the same time be paid to maintaining the general tone; in furthering which end, valuable aid will be found in the use of electricity and strychnine, combined with moderate exercise and fresh air, while anything tending to fatigue or devitalize should be prohibited. As may be imagined, they found with patients of this class that improvement was generally slow in manifesting itself. Whether or not a particular case would do well, time alone would show. Some progressed favourably; others, though apparently in the early stage and presenting an eruption, lost ground in spite of all therapeutic measures.

In certain instances coming under my direct observation, amendment has been sufficiently remarkable to justify one in strongly advising resort to the method in all such cases; but let me here again urge the supreme necessity of considering most carefully the requirements and susceptibilities of the individual sufferer, for in tabes especially

mercury must be given in no rule-of-thumb or haphazard fashion.

Speaking generally, a preliminary course of 100 rubbings (or more if well endured) is found to be satisfactory, with three or more intravenous injections of salvarsan, or a trustworthy substitute. Anything less than this cannot be considered an adequate trial of the method. Of the salvarsan small doses only should be given to begin with—say 0·2 gramme—and increased very gradually, if at all.

At Aachen the opinion was held that in tabes generally, and oculo-motor cases in particular, those which are going to respond satisfactorily to treatment ought to show some signs of progress by about the seventieth day, and I can bear out the accuracy of this interesting observation.

If improvement results, the rubbings are continued for two years with an interval of three to six months between each series.

Provided that benefit is derived from this, a few weeks' treatment given every six or twelve months (during spring and autumn if possible) for an additional period of some length is strongly advocated.

The internal administration of iodine *per os* during the cure is not recommended, as no risk should be run of upsetting the intestinal tract or causing depression. In the form of tiodine or iodipin

injections, however, if well tolerated, as is usually the case, it appears to be of considerable value by augmenting the therapeutic action of the mercury.

Among the remarkable results I have observed during such a course and subsequent to it, may be mentioned the lengthening of time between attacks of gastric and rectal crises, even to their complete cessation for months or years. A tendency to alarming cardiac attacks and anomalies of sensation has disappeared. Knee-jerks have returned or become more brisk. Oculo-motor troubles have vanished or been improved. The functions of bladder and bowel have been to a large extent restored, pains ameliorated, and weight, vigour, and general sense of well-being increased.

Everything, indeed, has pointed to the conclusion that the progress of the disease has been slowed or checked, and the patients placed in a position to benefit to the full by the necessary re-education of their motor tracts by judicious exercises—preferably in the manner advocated by Frenkel and Foerster—which of course must never be neglected. Case 3 is a good example of the sort of result one may not infrequently obtain, provided the diagnosis is made early enough, while even in fairly advanced conditions the change for the better which sometimes results from a thorough and prolonged application of this combined treat-

ment is really surprising. Cases 7 and 8 are notable instances.

The necessity for thoroughness in every detail, for prolongation of the course and for its repetition, cannot be too insistently urged. Incredible as it may seem, it is unfortunately not uncommon for patients in this country, who have markedly improved under a course of rubbings, to be allowed to relapse, without the need for another course having been pointed out to them. The records are full of instances of this kind, and they constitute a serious stigma on medicine. But the physician is not always to blame, for patients, even though fully warned, are very prone, in the absence of inconvenient symptoms, to shirk the means of cure.

Demonstration of the spirochæte in the meninges in tabes, and the impossibility of foretelling without an adequate test how a given case will respond to treatment, are facts which lend particular, and, it seems to me, irresistible cogency to the opinion of those who advocate prolonged and frequently repeated intensive mercurialization for this condition. In these circumstances, even though absolute extermination of the spirochæte may not be possible, at least the progress of the disease may in a great number of cases be rendered stationary. To make use here of a simile I have somewhere

seen, if we cannot put out the fire, we may at least prevent it doing more than smoulder. We know, of course, that improvement or arrest of progress in the disease under treatment may sometimes rightly be attributed to mere coincidence, as it is a matter of common experience that such a favourable turn may now and then occur in cases left quite to themselves. That possibility, however, can hardly be held, in the light of the excellent results obtained by a number of well-accredited observers, to form a sound argument for omitting a thorough trial of this simple and potent method.

Unfortunately, it is most difficult to get these people early enough, for at the onset the tabetic origin of their troubles is often unsuspected, and symptoms only are treated, valuable time being thus wasted. The pre-ataxic stage may be a long one, and if promptly recognized and properly managed, ataxia may never develop. Victims of early tabes not uncommonly complain of obscure abdominal pain (attributed perhaps to kidney, ovary, appendix, or gall bladder), of giddiness, neuralgia, pruritus, rheumatism, bowel atony, obstinate dyspepsia, or simply neurasthenia; so that unless great care be taken in investigation, the true significance of their sufferings is missed. As a result of mistaken diagnosis the patients are occasionally actually submitted to exploratory abdominal operations,

while quite frequently advice is given them to try spas and health resorts, which they do, in some instances on and off for years, naturally with little or no benefit. The journey itself is often very upsetting, and may take some days to recover from, while the baths, douches, and vibrations which many undergo may prove not only directly harmful, but may further tend to make them lose faith and patience regarding any method of treatment whatever. This is especially unfortunate in the case of sufferers from tabes, who require therapeutic measures of such a protracted nature, and in whom hope and confidence are such valuable assets.

Again, I have known instances of transient oculomotor[1] paresis attributed to 'liver' or to error of refraction, where a more thorough examination would have clearly demonstrated its tabetic origin.

In spite, then, of the variety of its manifestations,

[1] The special management of ophthalmoplegia cases during the critical time of onset is of importance.

They should at once have any error of refraction carefully corrected by glasses for constant wear.

Every encouragement should be given in the use of muscles at fault by means of orthopædic exercises. Daily injections of strychnine in the temple undoubtedly help. On no account should a shade be worn over the affected eye, or prisms be ordered (except as a means of exercise) until a trial of remedial measures has been made for two years. Non-observance of these points seriously jeopardizes the chance of complete recovery.

it is hardly an exaggeration to say that, with past experience and careful application of modern methods to guide us, there is to-day little or no excuse for failure to diagnose tabes at an early stage.

No reliance should be placed upon the patient's denial of having contracted syphilis. Indeed, where marriage is not contemplated, it is more than doubtful whether it is necessary or even advisable that the word should be mentioned at all to the patient. Modern clinical knowledge and laboratory methods may render it superfluous to do so, while it is well to avoid, if possible, any tendency to syphilophobia.

Some of the worst cases of tabes treated by me in recent years have been medical men, a class peculiarly liable to extra-genital infection. A fair proportion of them, while denying, in quite good faith, as I believe, all knowledge of having acquired the trouble, gave a positive reaction to the Wassermann test, and benefited by prolonged inunction. Even a negative blood test does not by any means serve as a contra-indication to mercury, for, as is well known, the cerebro-spinal fluid may still in such a case give a positive reaction. Though we cannot scientifically explain the good effect in this latter class, in view of the inaccessibility of the subarachnoid space to drugs of the type with which

we are dealing when circulating in the blood, the complex and varied pathological conditions grouped together under the terms of tabes and locomotor ataxia should be borne in mind. Finally it may be said that the best justification of the means used is the excellence of the results sometimes obtained.

Naturally one is unable to tell clinically, except by a thorough trial of therapeutic measures, whether the initial and possibly curable state of cellular infiltration has or has not been succeeded by the graver condition of fibroid degeneration. Certain it is that all cases do not do well—some either remaining uninfluenced or continuing to go downhill. The possibility indeed suggests itself that true tabes is not really amenable to antisyphilitic treatment, and that not true tabes, but a spinal syphilis presenting similar symptoms, has existed where good results have been obtained. In the early stages, differentiation between the two is sometimes impossible.

As already mentioned when dealing with the disadvantage of oral administration, I have frequently observed benefit to follow the application of the Aachen ritual among those who present symptoms of early tabes, where internal medication has been tried for prolonged periods, with the effect, apparently, of making the condition worse, or at any rate causing no improvement.

That such satisfactory results are seldom obtained

except by methods not commonly in use in this country, may explain the fact that the far-reaching effects of mercurial inunction have not yet received adequate recognition among British clinicians.

By applying the Wassermann test to the blood and cerebro-spinal fluid, and making a lymphocyte count and globulin estimation of the latter before, during, and after a course, diagnosis, prognosis, and indications for length of treatment bid fair to be placed on a sounder basis. The evidence pointing in this direction is already both considerable and interesting.

Mercurial Intoxication.

The onset of the toxic effects of mercury in the various organs may be manifested in the heart by palpitation, in the kidneys by albuminuria (which must not be confused with the globinuria often associated with severe secondary manifestations), and in the blood by decrease in hæmoglobin and disproportion of red to white corpuscles. In the nervous system it may be evidenced by tremors, and in the bowels by cramp and catarrh; while in the mouth it may be indicated by salivation, gingivitis, and ulceration. The subjective sensations of the patient are useful in estimating the effect on his general health. Careful watch must be kept, especially on those who no longer possess the resi-

liency of youth. A steady loss of body-weight which cannot be otherwise explained calls for temporary cessation or modification of treatment.

When, therefore, I point out the necessity for frequent and methodical examination of the various systems during this intensive treatment, the caution is more than a mere platitude. Experience alone will enable us to recognize the warnings as to when the limit of physiological tolerance has been reached, and so to stop short of the further stage of toxic influence.

Objections to Inunction.

To deal now with various objections which have been urged against inunction, and some of its supposed disadvantages—stomatitis, which is said to be a common result of the method, is almost invariably associated, as has been previously stated, with neglect of orders. Though inunction has been stigmatized as dirty, we have the testimony of patients submitted to the Aachen course that inconvenience in this respect is usually quite trivial. Dirty indeed is the go-as-you-please auto-inunction which I have so often seen practised in this country. This, as a matter of experience, is almost always sooner or later followed by the shirking of a task, even the

attempt to perform which, is both irksome and repugnant owing to the fatigue, not to say disgust, which it entails. Adequate performance is impossible. That most important site of application, the back, must actually be left untouched, unless the patient happens to possess a high degree of acrobatic skill. To expect a sufferer from tabes, in particular, to carry out this routine, is totally to misunderstand both the treatment and the disease.

As to its being 'advertising and compromising,' another count in the indictment against it, I frequently treat patients living with their wives and families without arousing any suspicion or disturbing domestic harmony. If referred to as a form of massage and sulphur baths, as, in fact, it is, and if a discreet rubber be employed, there is little reason for comment, and things generally go perfectly smoothly. Success, certainly, is dependent upon skill in rubbing and upon proper supervision. Failure usually follows amateur efforts, which are no more to be recommended here than in other departments of medicine. Even in Aachen the rubbers differ somewhat in capability, and the employment of one who is strong, healthy, well-trained and conscientious is essential. It may be of interest to mention here that, provided always they take certain necessary precautions in the matter of cleanliness and hygiene, their occupation rarely

causes them any ill-effects.[1] The treatment cannot be applied if there is much scarring or thickening of the skin, as after variola or in ichthyosis. Certain eruptions or very tender skins preclude its use, as does a marked intolerance of mercury. It involves, as a matter of course, the giving up of a certain length of time every day, and to a moderate extent the intelligent co-operation of the sufferer. Time is obviously saved, and there are other advantages, in undergoing the cure at home. Diarrhœa, dermatitis, lassitude, muscular fatigue, irritability of temper and pains in the limbs are consequences which, it must be admitted, may have to be reckoned with. As to objections founded on inequality of action, this may not improbably be due to the idiosyncrasy of the patient, or to the varying capability of the rubber.

Advocates of other modes of mercurial administration, when dealing with the disadvantages of inunction, sometimes include death as a possible sequela. One of the instances most commonly quoted in illustration of this danger was described a few years ago in a publication on the subject [11].

It refers to a very fat woman in whom eczema supervened upon rubbings, and whose death from

[1] These necessary precautions may be summed up as scrupulous care of hands, nails, and teeth, little or no alcohol, and as far as possible an open-air life.

exhaustion followed. It is not said what was the state of the kidneys, heart, or even of the general health, prior to commencing treatment, nor is any mention made of the amount of supervision exercised.

In cases properly conducted and medically controlled, such a result is, of course, absolutely impossible, and that an example such as this should be the one usually instanced as an argument against inunction is, to say the least, significant.

Advantages of Inunction.

The advantages of inunction, on the other hand, include safety, potency, and painlessness, as well as freedom from most of the objections referred to in connection with injections or internal administration. As inunction does not interfere with the digestive system, it permits of the simultaneous use, if necessary, of drugs by the mouth, and of subcutaneous, intravenous, or intramuscular medication. As it does not cause pain, there is no interference with ability to take exercise nor with capacity for enjoyment, nor is there the onset of sudden lameness (not infrequent with injection) to explain away. In a word, it permits mercury to be pushed to a degree impossible by any other method, and this without risk or pain.

In theory, it is true, the utility of the intensive treatment by rubbing has long been more or less recognized, but we are now in a better position to avail ourselves to the full of its advantages, thanks to the results of the Wassermann test. By this means, as has been mentioned, we can, in a large percentage of cases, ascertain at any moment the degree of the drug's effect on the poison.

Perhaps the fact that introduction is effected by way of the lymphatic system, the original stronghold of the treponema, and that the mercury enters over such a large area, may explain the rapidity with which early symptoms usually yield to its use by inunction; while in disease of the spinal and cerebro-spinal systems its application close to the seat of mischief, by the rubbing of the back, may partially account for the good results. Inunction is of all other means of giving mercury incomparably the best for a prolonged, and at the same time powerful, assault upon the causative organisms which are so deeply entrenched that nothing short of the strongest attack persistently pushed home can overwhelm them.

The attack, moreover, is from many sides, for in this form of administration the metal enters not only through the substance of the skin, but also through the air passages, by volatilization from its surface. The result is continuity of action, an

adequate rate of absorption, and a dose of great intensity.

As has already been pointed out, in the case of tabetics it is particularly desirable to avoid pain, dread, or discomfort, one or more of which are almost inevitable with injection methods. Here remedial means, to be of most use, must of necessity be continued over a long time and probably repeated; and as it is in the patient's own interests to gain his sanction and willing co-operation, it is of more than ordinary importance that these measures should not be associated by him with any dread in anticipation or disgust in retrospect.

Testimony in Favour of Inunction.

Striking unanimity exists among high authorities, past and present, as to the merits of inunction in the treatment of syphilis in all its stages. Fournier, for instance, with his vast experience, says [12] that he has 'perfect confidence in inunction *when well performed*'; and, again, that he is 'satisfied that it is equal to, if not better than, any other way of giving the drug.' He considers that it is especially called for in severe cases, such as in disease involving the cerebral or cerebro-spinal systems, the viscera, or the eye; as well as in those proving refractory to other modes of treatment,

such as severe tertiary glossitis. Neumann [13] believes that 'by inunction more certain as well as more lasting results are obtained than by any other method.'

These opinions were expressed prior to the introduction of salvarsan, but they form a valuable guide as to the comparative values of the different modes of giving the older drug.

It is of interest here to quote from one of the latest writers on the subject in this country, J. E. R. McDonagh, in whose work on venereal diseases [14] the following passage occurs: 'There can be no doubt that the best way of administering mercury is by inunction, but unfortunately this method is valueless unless carried out by a trained rubber.'

At military institutions devoted to the management of venereal trouble, such as Rochester Row, mercury is usually given by injection, but, for reasons I have already stated, in private practice I think it highly advantageous to substitute skilled inunction for the injection method. In this connection it is worth recording that Colonel Gibbard, R.A.M.C., who was publicly congratulated[1] by the late Professor Ehrlich on the effect of his measures, has told me that he thinks the only objection to the routine use of inunction in the service is the absolute impossibility of insuring the necessary constant

[1] International Congress of Medicine, London, 1913.

personal supervision over the men who carry it out. The professional rubber depends for his living on bringing his cases to a successful conclusion. This is not so with the non-commissioned officers and men who do the regimental rubbing, and it is found that they require continual watching to make sure that it is properly performed. Moreover, while deeply impressed with the excellence of the results of injection in the Army, I would nevertheless point out that the youth and general high standard of physical fitness of military patients, the facilities for their supervision, their discipline, and the skilled attention which they receive, make them more than ordinarily favourable subjects for that treatment.

Among other modern advocates of rubbing, especially for the later effects of the disease, are to be counted a number of experts, both English and foreign, who spoke strongly in its favour, particularly as applied to tabes, at a meeting of the Neurological Section of the British Medical Association, London, 1910, which, be it noted, was subsequent to the introduction of salvarsan. Reports of the proceedings will be found both interesting and instructive by those desiring further information.

Again, at a meeting of the Medical Society of London on November 20, 1911, Risien Russell, Farquhar Buzzard, and Wilfrid Harris urged the importance of this treatment. More recently, in

the discussion on the subject at the Berliner Medizinische Gesellschaft, on March 4, 1914, Citron, of the Charité, Berlin, proclaimed with no uncertain voice his belief in the advantages of inunction where mercury was to be given.

All, in fact, support the contention that failure to submit a patient with early tabes to prolonged and well-applied trial of this remedy (with or without the simultaneous use of other agents) is to withhold an excellent chance of amelioration or recovery.

Finally, the experience of J. E. R. McDonagh, H. W. Bayly, and Major French, with the Wassermann test amply confirms [15] the superiority of *properly performed* rubbing. It is only fair to mention here that other army workers [16], as a result of their investigation with the test, give the preference to injection over inunction. The difficulty, already alluded to, of getting rubbing adequately carried out in the Army (where injection is, therefore, probably the better treatment) may be considered a sufficient explanation of this diversity of opinion. Colonel L. W. Harrison, R.A.M.C., whose work is here referred to, permits me to say on this point that he considers there is no better method than inunction *if done efficiently*. On the whole, then, we may affirm that, considered from the various standpoints of safety, potency, painlessness, and evidence of the blood test, inunction is markedly

superior to any other way of administering mercury; and, of all methods of carrying out this procedure, the Aachen appears to be far and away the best.

The Aachen Method in England.

To go to Aachen for treatment is, of course, out of the question during the war, and in case of peace might not be feasible or convenient for many, even if proper sentiment did not interpose a veto. In normal times, besides possible business and other obstacles, there was always the deterrent consideration of the almost inevitable stigma attaching to a sojourn in a place with such a very specific reputation. The question often arose, therefore—and present conditions give it added urgency—whether the treatment by inunction and sulphur waters can be really satisfactorily carried out in this country. Having had a number of these cases under my care for some years past, my reply is emphatically in the affirmative, Provided that the full Aachen technique is rigidly adhered to, as good results may generally be confidently anticipated here as there.

None know better than the medical profession how comparatively valueless, in favour of a particular line of treatment, is the evidence of the average patient. By those best fitted to judge,

such evidence may be considered even damaging and somewhat of the nature of a patent medicine testimonial. Nevertheless, when instituting a comparison between *the carrying out* of the treatment at home and abroad, the views of old Aachen visitors are at least of interest. For, in the matter of ritual *qua* ritual, who is in a better position to judge than these veterans? The war has brought me into contact with several of them, who would otherwise have taken their cure in Germany. They one and all assure me that in the matter of rubbing and in other details, things are as well done in London as abroad.

The mineral water and bath salts, both made here artificially since the outbreak of war, are now obtainable, as well as facilities for their application, while in my experience it requires only a little management to procure the patient's acquiescence in a routine in some respects unfamiliar to him.

By this arrangement the invalid has the great advantage of keeping in close touch with his own medical attendant and being seen at intervals by him. He is also often enabled, wholly or in part, to follow his occupation, though if it be a strenuous one no endeavour should be made to carry on at full pressure, particularly in the later stages of the course. Half speed or just preserving contact with things may often be permitted with advantage. If

more be attempted, cure and clients alike will suffer. Naturally this continuance at work in cases of nerve syphilis is most feasible when we have to deal with early stages of the disease.

A minor detail to be determined is whether the ritual should be performed at the sufferer's own residence or at an institution with special facilities for the purpose.

Here, again, individual peculiarities must be taken into consideration.

Provided that an adequate supply of hot and cold water be available, with the usual conveniences of a house or hotel, and that there is no necessity for the slight additional degree of secrecy which is secured by giving inunction away from home, I am strongly in favour of using the patient's ordinary residence, especially in tabes and nerve syphilis. For one thing, his usual routine is less interfered with, while risk of chill as well as of fatigue is avoided, greater comfort insured and less demand made on the invalid's time.

Conclusion.

To recapitulate in a somewhat different form the substance of my opening pages, it is to be observed that in early syphilis, in order to procure the best results, salvarsan or a reliable substitute should be used in conjunction with mercury intensively ad-

ministered. Later on, however, when generalization of the poison has supervened, and it may be that the spirochæte is firmly entrenched in the deeper non-vascular parts, *e.g.*, the nervous system and periosteum, while the arsenical preparation appears not to be able to reach the parasites with certainty, mercury would seem still to retain that power.

Salvarsan frequently produces little or no effect in cerebro-spinal syphilis, and this is the type of case in which Mott [17], as a result of much work in this particular branch, so strongly advocates inunction.

Attention is drawn to the fact that, hopeless as medicinal measures usually are in general paralysis, instances undoubtedly occur—No. 6 of my series is a case in point—in which cessation or remission of symptoms takes place under prolonged rubbings. The discovery by Noguchi of the spirochætes in the brains of general paralytics may be considered an additional reason for an adequate trial of this remedy given simultaneously with iodide and small doses of salvarsan.

When once the diagnosis is certain, it is obvious that a disease like syphilis, fraught as it is with the possibilities of such dire results, immediate and remote, urgently demands in all its stages the most thorough and strenuous efforts compatible with safety, towards its eradication.

Half-measures in treatment should be considered no more pardonable than in the case of malignant disease, while the attitude adopted by only too many, of virtually ignoring the existence in our midst of perhaps the most serious disease to which mankind is heir, is only just ceasing to be accorded a tolerant acquiescence.

This naturally leads to the consideration of prophylaxis, as to which a few words are more or less unavoidable. The subject, with its various aspects —ethical, social, medical, and legislative—is confusingly complex and controversial. It is not here proposed to consider it from the social, ethical or legislative points of view (though on each of these sides wisely considered action might have most valuable results), beyond mentioning the fact that there exists just now in many quarters a strong feeling in favour of the judicious instruction of all adolescents in sex hygiene. This might well be supplemented by a warning as to the serious results of venereal disease, and, when it is contracted, as to the need of promptly invoking skilled assistance. In view of the grave consequences which may follow ignorance, it certainly seems better to err, if indeed one can err, on the side of imparting too much than too little knowledge. One cannot feel very optimistic, however, as to the results of these proposals, when one bears in mind the carelessness

so frequently displayed as to infection by those whose occupation familiarizes them with the danger in question.

I wish here only to draw attention to one point, on account of its great practical importance if properly carried out, especially as we have to deal with human nature as we find it. To Metchnikoff we owe the discovery that, if shortly after inoculation with the *Spirochæta pallida* the seat of entry be well rubbed with a 40 per cent. calomel ointment, it is quite likely that no further symptoms will develop. Though this plan is not invariably successful, its value has already been proved beyond question. With its many possibilities of application, that it should be widely known appears for numerous reasons to be highly desirable.

When we consider the consensus of opinion in favour of inunction it seems a matter of regret that some arrangements for its application on an extended scale were not recommended by the Royal Commission on Venereal Disease. The use of a portion of existing public or private baths would make a good beginning, while the training of a number of skilled rubbers is only a matter of time. Delays are dangerous. The early and thorough eradication of the poison has become more than ever advisable in our day, when the prevailing habits of rush and high pressure in both work and play—

and latterly, the exigencies of war-time—predispose in a marked degree to the increase among us of a degenerative type of disease of the nervous system, and to the liability of inefficiently treated syphilitics to become victims of locomotor ataxia and general paralysis.

The effect of physical and mental strain as predisposing factors was shown by the numerous instances of these troubles which developed in France and Germany after the war of 1870.

It may be recorded as a significant fact that of the many cases of tabes and specific nerve mischief which have of late years passed through my hands, apparently none had been submitted to properly applied inunction during the early stages of syphilis.

In this account of the various modes of treatment I have endeavoured to deal as fully and accurately with my subject as limitations of space have allowed. Nevertheless, I would have it borne in mind throughout that the corporeal reactions to mercury intensively administered are apt to be disconcerting; and not corporeal reactions only, for outbreaks of emotional disturbance and tendency to caprice (against which the sufferers and those closely associated with them should be warned) are often very much in evidence towards the end of a course. This is noticeable especially in those whose occupation is of a strenuous character and who try to carry

on as usual. The amount of detail in the treatment and the necessity for modifying it to suit individual peculiarities has been emphasized. Experience must be supplemented by close attention, if the best ultimate results are to be obtained with the minimum of inconvenience to the patient.

Illustrative Cases.

Below I have given a few illustrative cases, all of which, where possible, are still under observation, or have recently been communicated with.

A period of about six to eight years has thus elapsed since they first came under my notice.

As relief of symptoms in syphilis of the nervous system is too frequently claimed as cure, the value of clinical histories is greatly increased if extended over some years, by enabling us to estimate better the duration of improvement as well as to remedy and to profit by mistakes. So far as it can be done, indeed, we should see the end before recording a judgment, as the old maxim has it. This view has determined me in using, with one addition, my original records. They show among other things that it is often (in spite of warnings) extremely difficult to get patients—even of the better class—whose immediate troubles have been removed, and who are feeling well, to submit to further courses extending over two years, perhaps with repetition

of treatment at regular intervals, in the hope of completing the cure or of preventing relapse.

CASE I.—*Cerebellar and Spinal Syphilis.*—In December, 1910, I met Sir Alfred Fripp and Dr. Henning Belfrage in consultation with reference to a man of forty, who lived in the country. He had suffered from fits, headaches, progressive weakness, loss of memory, and well-marked ataxia. He had, shortly before this, seen a neurologist (the late Dr. Savill), who correctly diagnosed spinal and cerebellar syphilis. The report runs:

Syphilis had been acquired eighteen years previously, and the patient had been treated for two years with mercury by mouth, and subsequently by courses of mercury combined with potassium iodide for varying periods. His present relapse began three years ago, when he was laid up with an attack of delirium and partial paraplegia. Since then his speech has been thick, he has been partially deaf in one ear (watch not heard on contact), occipital headache was intense, Romberg's sign was present, and the knee-jerks were exaggerated. He tended to fall to the left. The ordinary gait was very ataxic, and he could walk only a short distance, and that with great difficulty. He was afflicted with frequent fits, followed by complete amnesia, lasting for some time afterwards. Signs of early optic neuritis were present. Wassermann test was strongly positive.

He was submitted to intensive mercurial inunctions, with sulphur waters internally and externally in accordance with Aachen methods, and was given potassium iodide by the mouth. At the end of two and a half months he had lost most of his symptoms, memory had improved, and he could walk six miles without fatigue. There was a marked increase in weight, and his general condition was better than it had been for years.

Dr. Belfrage reported (March, 1916) that the patient subsequently 'earned his living while leading a hard, open-air life, and has never looked back.' For precaution's sake he had a few short courses of injections afterwards, as his work made it impossible for him to come up to London for inunction. When last heard of he was travelling for pleasure, and was in every way a fitter and stronger man than he had been for twenty years.

CASE 2—*Cerebral Gumma.*—Early in 1912 I saw a professional man, aged forty, whose history was as follows: Sixteen months before that date he had acquired syphilis, which was treated with a full dose of '606' intravenously, and then with mercury pills by the mouth. Six months later, while still under this treatment, he developed partial ptosis of one eye and extreme pain in the head. He rested in bed, and was given cyanide of mercury by injection, with potassium iodide by the mouth. The

condition proving obstinate, he tried a strict rest cure, and at the same time inunctions were given by a nurse for half an hour to one hour and a half daily, until early in May, but without avail. During this time matters gradually became worse, and the paralysis of the third nerve became practically complete. There was slight proptosis of the affected eye, due probably to muscle weakness.

He was then seen by a brain surgeon, who considered that, as medicine had apparently failed, the condition was sufficiently grave to require an exploratory operation with a view to relieving the local pressure, due, it was thought, to a cerebral gumma. Before submitting to this procedure, the patient consulted Dr. Risien Russell, who referred him to me for treatment, with the advice that, if no improvement occurred in a month, the operation should be performed. I treated him by inunctions in the Aachen manner, and 20 grains of potassium iodide every six hours by mouth. In ten days he could slightly raise his upper lid; at the end of two months and a half, except for the ophthalmoplegia interna and slightly deficient power in the internal and inferior recti, there was nothing wrong with the eye, and binocular vision was obtainable in several positions, to his great comfort and relief.

As I was leaving town for a change, and the patient was inclined to do the same, I sent him

abroad for a course of treatment of one month. Progress was uninterrupted, and he now finds that the condition of the affected eye causes him but slight inconvenience in the pursuit of his arduous occupation, which he has resumed. His general health is excellent, though he wisely undergoes a short course of mercurial treatment twice a year as a precautionary measure. Particularly striking is this success achieved by Aachen methods, when it is considered that trial had previously been made, without any observable results, of mercurial injections, internal administration of mercury, and its inunction by a different method; as well as of one injection of salvarsan.

CASE 3—*Early Tabes.*—Six years ago I was consulted by a professional man, aged fifty, who, while laid up with a severe attack of what was supposed to be intercostal neuralgia, suddenly developed diplopia, due to implication of the third nerve on the left side. He occasionally experienced bouts of 'rheumaticky' pains, which were attributed to a very pronounced pyorrhœa, which was cured, however, without affording any real relief from the trouble. On examination, the knee-jerks were absent, the pupils were small, and exhibited the Argyll-Robertson phenomenon, and slight Rombergism was present. There was a history of syphilis thirty years previously, which had been

treated at the same time by pills for two years, and medicine had been frequently taken at intervals since then when skin manifestations rendered it necessary. The Wassermann test was strongly positive.

I gave him 100 rubbings in the Aachen manner, under which the ocular paresis and intercostal pains disappeared, and have not since returned. He put on 5 pounds in weight under treatment. The Argyll-Robertson phenomenon remains unchanged, and the knee-jerks are still absent, but there is now no ataxia.

A Wassermann test every six months since he first came under observation has proved negative; nevertheless, at his own instance he yearly takes a short precautionary inunction course, which he finds increases his sense of well-being, and relieves fugitive pains which are prone to occur during March winds. He has now married, in spite of my advice to the contrary. His recovery of co-ordination is well shown (July, 1918) by a marked improvement in both billiards and golf, and his capacity for work and enjoyment have much increased.

CASE 4—*Syphilis of the Labyrinth associated with Neuritis.*—This was Mr. Arthur Cheatle's diagnosis of a case he kindly sent me early in 1910. The patient, a strong, active professional man of thirty-eight, had acquired syphilis about eighteen years

before, and had taken mercury in the form of pills and potions on and off for eight years, as he had occasionally very slight reminders on his skin.

Since 1900, however, as he had experienced no symptoms for some six months, treatment had been suspended, and he was pronounced cured. In 1909 he had an attack of 'neuritis' in his right arm and shoulder. This was much relieved by aspirin, though some numbness remained. He was treated by a course of baths and waters at Harrogate without result. Some six months later loud noises developed in his left ear, soon accompanied by total deafness. A Wassermann test proved strongly positive. This was his condition when I first saw him. He was given 100 days of Aachen treatment, and a month afterwards tinnitus and numbness had all but disappeared, while his deafness was so slight as to cause him no inconvenience. Three months after treatment the Wassermann reaction was negative. He subsequently had a few courses to insure against relapse. Remaining to all intents and purposes well, he grew heavier than before his attack, felt remarkably fit, and lived a hard, open-air life till the summer of 1913, when a slight return of tinnitus led to the discovery that his blood gave a positive Wassermann reaction. Another course of intensive mercurialization with two small doses of

neo-salvarsan soon caused disappearance of symptoms. In spite of the fact that Wassermann tests were negative, he had six grey oil injections every six months, as convenience did not permit him to come to town for rubbings, and he appeared quite well. In October, 1915, having finished a course of injections only a few weeks before, he suddenly developed a return of his original symptoms, and the blood test was strongly positive.

Again an intensive mercurial course with three intravenous injections of neo-salvarsan and KI internally has effected a great improvement. Work has been resumed once more, but there is no doubt that he ought to have had his original course repeated in full, or with slight modification every six months for some years after the first attack, and it is to be regretted that this was not practicable.

When I saw him last, in the autumn of 1918, he was very well, though his life had recently been one of great fatigue and exposure.

CASE 5—*Cerebro-Spinal Syphilis.*—In May, 1910, in consultation with Dr. Hale White, I saw a young professional man who had acquired syphilis fourteen months before, and had taken Hutchinson's pills continuously up to the end of December, 1909, when he was exposed to cold and fatigue, and one evening was seized with paresis of left face, arm, and leg.

This cleared up under potassium iodide and mercurial injections. In a month he was about again and apparently well. Towards the end of February he suddenly experienced severe abdominal cramp and return of weakness in the left leg. The right leg soon became affected. As there was a marked blue line on his gums, and subacetate of lead was discovered as an impurity in his medicine, there was some difficulty in deciding whether plumbism or syphilis was the origin of his trouble. The Wassermann reaction proved negative, though, of course, no great importance was attached to this, as he had been given mercury by mouth and injection for eleven months previously. A lymphocyte count of his cerebro-spinal fluid threw no fresh light on the matter. He was given potassium iodide in large doses, with some mercury, but he rapidly became paraplegic and bedridden, and had incontinence of fæces and, to some extent, of urine. I put him on Aachen treatment, with potassium iodide by mouth and injections of arseniate of strychnine. At the end of a fortnight he showed signs of improvement, and in two months he was able to walk with the aid of a stick. Progress was slow, but sure. Short courses of mercury by inunction or injection were taken at regular intervals; he gradually resumed his ordinary life, which involves much strenuous exertion, and quite recently married.

CASE 6—*Early General Paralysis.*—In July, 1910, a business man, aged forty-one, suffering from nervous breakdown and loss of memory, was sent to me by Dr. Maurice Craig. Early in the year he had to give up work on account of insomnia, failure of memory, and marked general weakness. He lacked power of concentration, and had developed a frequent and silly laugh. On the advice of a physician a trial was made of mercurial rubbings, about forty in all, performed by the wife of the patient, his condition necessitating his remaining in bed for four months.

He then went to the seaside for a month, but made very little progress, so his firm dismissed him. Dr. Craig, who was consulted about this time, considered him a case of general paralysis, and referred him to me for treatment.

I gave him 100 days of baths and rubbings, performed strictly in the Aachen manner, and after a rest he had a few dozen more rubbings, some iodipin being taken by the mouth. During the first few weeks improvement was manifest, and has slowly continued up to the present time. The following autumn he was well enough to return to the City for several hours daily, and to render some assistance to a firm engaged in his former line of business. His doctor reported (March, 1914) that, 'though he is not quite the man he was, with the exception of a

little weakness of memory and a slight tendency to emotional disturbance, it would be difficult to detect anything wrong with him.'

Since this time he has been treated by a mercurial course on several occasions, and the same doctor's latest report of the case, in June, 1918, was that 'he has distinctly improved during the past few years. One might carry on a conversation with him for some time without finding anything wrong, but on testing his memory one finds it is defective, especially for recent and trivial events; his emotions are better under control and he is able to carry out instructions, but he has not much initiative. It must, without doubt, be called a very satisfactory result.'

CASE 7 — *Advanced Tabes.* — Professional man, active and keen on sport, aged fifty-five. Father of a healthy grown-up family. No history of syphilis. Began to suffer from fugitive pains in limbs and trunk about the year 1904.

Accustomed to exposure and fatigue, he attributed his troubles to rheumatism. Several doctors were consulted, who prescribed salicylates and care in diet and clothing. These were tried, without much benefit, and it was not till the onset of oculo-motor trouble in 1906, due to third nerve paresis on left side, that tabes was suspected.

Pain-killing drugs and change to a warmer climate

were advised, with only temporary good result, and he gradually became quite unable to walk without assistance, in which state he remained for several years, suffering most acutely from lightning pains. A very extended trial was made of organotherapy and nitrite of sodium, both being given by injection, but he was never satisfied that either had any effect upon the disease.

I first had an opportunity of properly examining him in October, 1912. The Wassermann test was strongly positive. I found Argyll-Robertson pupils, absent knee, wrist, and ankle reflexes, and much wasting. He had much difficulty in passing water, and was very constipated. Dr. Risien Russell, who saw him with me, agreed that, hopeless as things looked, it was worth while trying the effect of intensive mercurial treatment.

He had arranged to go abroad for the winter, but on his return early in the summer of 1913, the condition being unchanged, he had about three months of inunctions in the Aachen manner, and a couple of injections of salvarsan, 0·3 gramme each. He was at the same time submitted to a course of instruction in Frenkel's exercises. His improvement at the end of two months was remarkable. He could walk with the aid of a stick, had put on flesh, and looked a different man. Owing to the development of a trophic ulcer, he had a set-back about this time,

but expressed himself regarding the effect of the treatment as both surprised and very well satisfied. By a combination of uncontrollable circumstances he was withdrawn from my care soon afterwards, has had no further inunction, and has rather tended to relapse. The temporary change for the better, however, which occurred when he was first taken in hand, was one of the most striking things I have ever seen.

CASE 8—*Severe Gastric Crises.*—The following case was referred to me for treatment by Dr. Risien Russell in the autumn of 1911:

A business man of middle age, occupying a responsible and anxious position, contracted syphilis in 1894, and had taken mercurial pills for two years.

He had remained apparently well till 1906, since when he had suffered from occasional 'rheumaticky' pains, and experienced a sensation of giddiness when washing his face.

In the spring of 1911 he began to experience what he described as 'stomach twitches,' occasionally accompanied by intense pain in the epigastrium. This was associated with vomiting and great prostration, necessitating some twelve days in bed, rectal feeding, and the free use of morphia. The attacks were recurrent at irregular intervals, and each one not only involved a decided risk to life, but left him

weaker and more disheartened. He had lost a stone in weight since they began, and looked anxious and ill. Gait was ataxic, and he had the Argyll-Robertson pupil. The knee reflexes were absent. He was very weak, and unable to walk more than a few hundred yards. It proved necessary to handle him very gently, as, shortly after beginning treatment, he had several attacks—one of them most serious, requiring confinement to bed and to the house for several weeks. His condition, indeed, was so grave as to make Dr. Risien Russell seriously contemplate the advisability of having the posterior nerve roots divided if improvement did not soon occur.

Under the steady application of the Aachen method, assisted by two small doses of salvarsan, the tendency was towards gradual recovery. The duration of the attacks was markedly shortened, and the interval between them prolonged. He was able to walk a mile without fatigue. In March, 1914, he reported no gastric attack since August, 1913, and that he was feeling much better.

During 1915-16 he had no further treatment of the specific mischief, and no return of the gastric crises, while improvement in walking was fairly well maintained. This was his condition till early in 1917, when he died quite suddenly; an instance, in all probability, of a liability which would

appear to be more common among tabetics than others.

CASE 9—*Obstinate Throat Syphilis associated with Chronic Bright's Disease and High Blood-Pressure.*—In the summer of 1912 a busy, elderly man was referred to me for treatment by Dr. Lambert Lack on account of an obstinate secondary syphilis of the throat, which had defied the usual remedies. He had definite signs of granular kidney, with high blood-pressure, and had shown a marked intolerance for iodide and pills. Inunction applied to the axillæ and groins was followed by an acute local and mild general dermatitis.

Naturally, the condition of his kidneys precluded the use of salvarsan or mercurial injection, so, as obviously something had to be done, unless the disease were to be allowed to go on unchecked, it was decided to try the Aachen method.

I found, as was to be expected, that he was very susceptible to mercury, as shown by increase in the amount of albumin present and by marked lassitude shortly after commencing the cure. With care, however, dropping a day now and then when necessary, and rarely exceeding a rubbing of twenty minutes' duration in a six weeks' course, the throat symptoms soon cleared up. Subsequently he underwent a few series of rubbings, each characterized by the same phenomena, and remained quite free

from any further manifestation of specific trouble. Blood tests done at intervals after the last course proved negative.

He died in 1917 from the effect of granular kidney, having kept in excellent health until acute symptoms were brought on by overstrain and exposure.

This is an interesting example of the good effects of the treatment in a most unfavourable subject, and after the failure of several methods—such as pills, iodide, and inunction performed in a different fashion—to influence the condition.

CASE 10.—A medical man of forty consulted me in January, 1912, for difficulty in walking. He presented the usual signs of tabes, and his condition was such as to render the use of a stick essential. No history of syphilis.

His trouble had begun two and a half years before with an attack of diplopia, which was considered to be toxic in origin. At this time the pupils reacted well to light. He improved under strychnine, and got quite well in a few weeks. A year later a second attack of a similar nature occurred, with the appearance of the Argyll-Robertson pupil. A Wassermann test proved negative. Shortly afterwards he had an attack of laryngeal stridor, and experienced some difficulty in dancing and playing golf. This was due to definite ataxia, which had developed within a few days.

Tabes was then diagnosed.

He spent a month in bed, treatment consisting of general massage, Frenkel's exercises, and soluble mercurial injections, and soon became very much improved.

About six months later ataxia again came on quite suddenly, much worse than before, and with no apparent cause, associated this time with loss of bladder and rectal sphincter control; a Wassermann test proved strongly positive.

He was then given salvarsan injections intravenously—dose, 0·3, 0·4, and 0·6 gramme, at fortnightly intervals. Frenkel's exercises, massage, and faradism were again tried, but produced only slight improvement.

I now saw him for the first time, and prescribed inunctions in the Aachen manner, with lymphoid serum injections, which he had for over ten months, undergoing 250 rubbings in that time. The Wassermann test then proved negative, and has persistently remained so ever since.

He has gone on steadily with the treatment at intervals, and has had fifty rubbings each year since then. He has also taken a few courses of Hectine and Enesol (20 ampoules in each course). Progress has been slow but sure, and beyond a slight appearance of stiffness in walking, which he does without a stick, there seems little wrong.

The patient himself is convinced that the satisfactory state at which things have arrived is largely due to the inunction treatment, which, he has every reason to believe, has caused the mischief in the cord to be completely arrested. He has increased in weight during treatment from 12 to 14¼ stone, and, though submitted to an unusually large number of rubbings (525 up to midsummer, 1918), has never been inconvenienced in any way whatever. He has been seen at different times by Dr. James Collier, Dr. Risien Russell, Dr. Frenkel, of Berlin, and Professor Förster, of Breslau, all of whom confirmed the diagnosis of tabes.

In March, 1916, he had the misfortune to fracture his ankle, in spite of which there has been no increase of inco-ordination.

The very satisfactory result obtained in this instance may reasonably be in part attributed to treatment other than inunction.

The case, however, serves to illustrate particularly well a point I have previously urged—namely, the amount of intensive mercurial treatment (this patient has had several hundred rubbings) which it is possible to undergo without salivation, gingivitis, or, indeed, any untoward symptom, provided always that adequate precautions are observed.

CASE II—*Prolonged Treatment for Gastric Crises.*—In June, 1916, I was consulted by a professional

man of forty-one, who was kindly referred to me by Mr. Richard Lake. He complained that for some weeks he had suffered, after the slightest exertion, from burning pains in the shins. The condition was getting worse, and he requested me to give him a course of Aachen treatment, as similar trouble in the past had disappeared after a visit to that spa. Having only recently become aware that any attempt even was being made to reproduce the Aachen routine in this country, he was sceptical as to the feasibility of carrying out the exact technique, but was willing to give the time necessary for a thorough trial.

He was well nourished. Refused a Wassermann test. Urine normal.

Reflexes: Knee, absent; ankle, absent; wrist, absent. Pupils: Presented the Argyll-Robertson phenomenon. Motor: Walked cautiously; slight Rombergism, otherwise normal. Sensory: Areas of anæsthesia existed over trunk and limbs. In both bladder and rectum there was some deficiency in motor power.

History.—In 1896 acquired syphilis. Rash marked. Glands in groin small.

Treatment.—Hutchinson's pills for six months, when he was pronounced cured and resumed his normal professional life. He had no further symptoms until the end of 1902, when he found difficulty

in singing, choked without any obvious cause, and was troubled with giddiness. In 1903 he tried a holiday for some months, but on his return felt no better, was very depressed, and became unsteady on his legs from time to time, even falling down.

He consulted Dr. Risien Russell, who diagnosed tabes, and ordered rest in bed, general massage, and inunction of mercury in axilla and groins daily for a few weeks. This, in addition to potassium iodide internally, was persevered with for six weeks. The patient felt better and went away to the country for three months.

In May, 1904, he had a series of bad gastric crises during which he nearly died. Morphia and ether injections and feeding per rectum became necessary. After this he was confined a great deal to bed, and in the intervals could only be said to 'crawl about.' He was then advised to try inunction at Aachen.

Going there in January, 1905, he was placed under the care of the late Dr. Feibes, who confirmed the diagnosis of tabes, and on his advice the patient was submitted to seventy-six rubbings. Shortly afterwards he had another bad attack of gastric crises and heart failure. Again he nearly died, requiring morphia and ether injections and rectal feeding. He improved, but after thirty-two more rubbings had a further alarming crisis.

In July still another crisis occurred, necessitating rectal feeding, etc., as before. Subsequently—to tabulate his record—he had:

In October to November, fifty rubbings at Aachen.

In 1906, two visits to Aachen—sixty and fifty rubbings.

In 1907, one visit to Aachen—forty rubbings.

In 1908, two visits to Aachen—forty rubbings each time.

In 1909, one visit to Aachen—forty rubbings.

From 1910 to 1914 inclusive, he paid an annual visit and had forty rubbings on each occasion.

The amount employed for inunction was usually 5 grammes, and the time twenty minutes.

Bath duration: About fifteen minutes. Bath temperature: 35° C.

Several trials were made of increasing the amount to 7 grammes and the time to thirty minutes, but as, after a few days, slight albuminuria and general upset supervened, the smaller amount was resumed.

In 1915, no treatment. A Wassermann test done in the winter was negative.

In 1916, when he consulted me in the spring, the complaint was that he felt he was going back, as shown by burning feelings in the shins after quite a short walk, and a tendency to giddiness after sitting down.

I advised forty rubbings with full Aachen tech-

nique. These were carried out at his own house—a plan which is of great advantage in cases of this type. As his wife had accompanied him during his many visits to Germany, there was no necessity for explanation or excuse.

A few weeks afterwards his discomfort had gone and he had attained his usual level of health.

He expressed surprise that the technique with which he had become so familiar at Aachen could be reproduced in its entirety in London.

This patient paid thirteen visits to Aachen and underwent 734 rubbings. It was not until 108 inunctions had been given that definite improvement was noted and the crises ceased. He was never salivated nor did he suffer from gingivitis. His weight is now normal for his height, and has increased 3 stone since beginning treatment. In the summer of 1918 he did a short precautionary cure, and is now occupied with good and important work.

The case would appear to be worthy of record, as demonstrating the benefit of Aachen methods in tabes complicated by bad crises, as well as the advisability of perseverance with treatment in spite of the apparent failure suggested by further crises during and between the earlier courses of rubbings. The therapeutic measures adopted throughout were those which may be termed Aachen treatment pure

and simple—that is, inunctions assisted by the use of sulphur water, internally and externally.

The patient has always refused to submit to injection of salvarsan or its substitutes, or to a trial of salvarsanized serum, preferring, as he said, 'to keep his subarachnoid space untouched.' It is interesting, if futile, to speculate what the man's fate would have been had inunction been abandoned, as frequently happens when, after a few dozen rubbings, another crisis occurs.

His history, at all events, furnishes a striking confirmation of the view that not until a thorough trial of the remedy has been made can any opinion be formed as to the final result.

A point of minor interest in this case is the favourable opinion which it incidentally reveals on the part of an intelligent patient, who has paid a number of visits to Aachen, as to the manner in which the Aachen method is carried out in England.

Summary.

In the majority of cases of syphilis in all its stages the administration of mercury is the most important factor in effecting a cure.

Of the various ways of effectively giving the drug —above all, when it requires to be pushed—well-performed inunction is incomparably the most

powerful, safe, and free from pain, and often succeeds when other methods have failed. Though valuable in every stage, it is specially indicated in nerve syphilis and tabes. By its means in a considerable number of instances the progress of the tabetic mischief can be slowed or checked.

In the latter case the improvement may be maintained for many years, while retardation of the mischief is in itself eminently desirable.

Among the modes of inunction, that known as the Aachen treatment possesses marked advantages. Its efficacy depends, however, upon the employment of skilled rubbers, close attention to detail, and careful supervision.

Since a visit to Aachen is not possible at present (1918), it is well to know that this treatment can be effectively carried out in England, as the records I have cited may be held to prove—always with the proviso that the methods followed be closely in accordance with those practised at that spa. In that case, there would seem to be no difference in the results finally obtained. Events have now made it superfluous to weigh against the convenience of treatment here any advantages or attractions which Aachen may formerly have possessed for English patients.

Cure and Marriage.

How sad a pitfall the word 'cure' may prove to be is only too well known to medical men, especially when used with regard to syphilis. Questions, nevertheless, are constantly arising as to the eradication of the disease with special reference to fitness for marriage. Some definite pronouncement on the subject is expected from us, and in the circumstances we must be prepared, with all due caution, to give it.

Our present position may be put thus: If, in a patient who formerly had a positive Wassermann reaction, a negative result of the test is obtained after a year has elapsed without treatment, it may be considered likely that he is cured. To insure even greater probability, a provocative dose of neosalvarsan 0·45 gramme (or its equivalent) should be given and the test done in forty-eight hours. If the result is again negative, it is probable in the highest degree that the infection has been overcome.

But it must always be remembered that the Wassermann test indicates a change of metabolism induced by the spirochæte—a change which is also brought about by other infective agents—*e.g.*, certain protozoal or microbial infections, such as leprosy and tuberculosis.

This uncertainty is exemplified especially in cases

of nerve syphilis, concerning whom it seems we can never be sure, though examination of the cerebro-spinal fluid by Wassermann reaction, globulin estimation, and cytology, may be of great assistance in arriving at an opinion, favourable or the reverse.

If a patient responds satisfactorily to the above test, marriage may be permitted—except in those who have had serious nerve symptoms. If the response to the test is unsatisfactory, careful individual consideration must be given to the case and allowance made for amount of previous treatment. Marriage ought certainly to be deferred till two years' thorough treatment has been undergone. If even this advice is refused, then an adequate course immediately prior to marriage should be urged. Considering all that is at stake, it is wise to avoid risk of conception till a satisfactory response is made to the provocative injection test.

The question of marriage in cases of nerve syphilis requires to be separately considered. The interests of these people are best served by remaining single. This is especially true of tabetics. Most of us can point, it is true, to married victims of nerve syphilis in whom the disease seems to be at a standstill, and this fact may seem to make the advice just given unduly drastic and comprehensive. Nevertheless, the taking of grave risks is to be emphatically discouraged, even though disaster may not always

immediately follow. Apart from the possibility of transmitting infection, the danger here is twofold—that of making the disease worse, and that of bringing unhappiness upon the wife. The matter is as complex as it is serious, involving, as it may, not only the patient and the wife, but perhaps the family and, in its ultimate consequences, the State.

Sentiment must be put aside, and the position frankly explained in all its bearings to the patient, with whom at present rests (wrongly, as many think) the power in his own case to decide this delicate and difficult problem.

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